Red Rock Canyon National Conservation Area
Environmental Education Program
Field Trip Program
Growing up in the Desert
Revised 1/10/01

Grade: Second

Theme: Students will join a hard shelled "critter" on a journey as it grows from birth to adulthood.

Curriculum: Life Science requirement which state that students are expected to "observe and describe the growth and life cycle of plants and animals and make connections between living things."

Objectives: Student will identify at least four hard-shelled organisms.
Students will compare and contrast life cycles of at least two organisms.
Students will look at the life cycle adaptation of at least one organism.

Background: Harsh desert conditions, such as high temperatures, scarcity of water, constant winds, and lack of soil nutrients, make it difficult for many plants and animals to exist. An organism can make itself more suited to its environment by changing physical or behavioral characteristics. This is known as adaptation. Desert animals have developed a variety of strategies or adaptations for thriving in a land of extremes. One way to adapt is to modify the life cycle. This program will explore the life cycles of four desert occupants to compare and contrast the different means to continue their species survival. These are mammals (humans), insects, reptiles (tortoises), and plants.

Vocabulary:
Adaptation: a physical or behavioral characteristic that makes an organism, pre-suited to its environment.
Camouflage: an adaptation that enables an organism to blend with its environment.
Environment: all those factors both living and non-living, which make up the surroundings of an organism.
Hibernation: To pass through the winter in a state of inactivity – over wintering.
Reptile: Cold blooded, usually egg-laying vertebrates with external horny scales/plate. Breathe by means of lungs.
Habitat: The place where an organism starts life, lives, and die's in nature.
Species: A group of organisms that have common traits or attributes. A like species can generally interbreed.
Mammal: A warm-blooded, fur or hair covered organism that bears live babies.
Insect: An organism with an exoskeleton, body divided into three parts, 3 pairs of legs, 1 pair of antennae and many adults bear wings.
Antennae: Little feelers on the top of an insect's head. Antennae are like radio antennae. They receive messages of sound and motion for the insect.
Thorax: The middle section of an insect's body, between the head and abdomen.
Abdomen: The end farthest away from the head of the insect.
Exo-skeleton: The hard shell-like covering on the outside of an insect's bodies.
Metamorphism: When bodies change shape at the same time they shed their skin.
Molting: When the exoskeleton cannot stretch any further to accommodate additional growth, the old "skin" is shed and replaced by a larger one. Most insects molt 4 or 5 times during their life, but some may molt as many as 40 times.

Pre-Field Trip Activity: You and your life. How have the kids changed through their lives? Make an Insect.

Site Activity: Welcome and Introduction to Red Rock Canyon Conservation Area. Discuss with the children the following questions - How do things survive? How do they eat and find nourishment? Find shelter or water? How do things reproduce and grow? Explain that today they will compare how humans, insects, tortoise, and plants survive in the desert and change through their lifecycle.

Human: Discuss the growth of a human from baby to adult. Use examples from own life to introduce children to concept of lifecycle and growth. Discuss items of clothing, helmet, glasses, slipper, picture in supply box.

Insect: Bugs vs. Insects? Describe life cycle stages. The exo-skeleton or outer covering helps protect the soft inner body parts of the insect from damage and water loss.

Complete Metamorphosis

Eggs- tent caterpillar
Larva- Woolly bear caterpillar (finds shelter under leaves and grass)
Pupa- Crecropia moth (cocoon)
Adult- Bees (eat stored honey, or torpid)

Incomplete Metamorphosis

Most over winter in egg stage. Those that spend part of their life in the water, however, may over winter in nymph or larval stages. (Stonefly, caddisfly, dragonfly, water boatmen)

Example- grasshoppers die -leaving eggs deposited in the ground
Egg - Nymph - Adult

Activity: Divide children into pairs or groups of three and pass out materials. Review assignments and procedures. Assign areas to look for insects and have them look (10 minutes). Discuss findings or lack there of.
Supplies: Petri dishes and nets and magnifying lens

Winter Activity: *Use Shuffle for Shelter* to illustrate how insects find shelter. Discuss which insects would be found in each of these habitats.

Supplies
A. Habitat labels, plant leaves, duff, water pools, ground burrows, mud, cactus wren, tree cavities, bark, hives
B. Examples of galls, desert trumpet
C. Music and player

Winter Hideaway Activity: Divide the children into teams and explore the area for over wintering insects, putting discoveries on the map. Combine on master map.

Tortoise:

Life cycle of a tortoise - See exhibit in Visitor Center.
This animal also "over winters", is born from an egg, has a hard shell, and bones:
What does a tortoise do in the winter and summer to deal with extremes in temperatures?
The tortoise must face many obstacles in its life to reach maturity.
Use the "Turtle Hurdle" Activity with desert variation.

Plant:

Life cycle of plant – This plant has a "tough covering " and may be a food source for the tortoise. It cannot move. It must deal with extremes in temperatures too. What could this be? (Plant)

Activity: Life of a desert plant; journals. Explore / find a "young " Joshua tree and a mature tree. Observe and draw.
Supplies: Joshua tree seeds
Clipboards / Sketch paper
Plastic bags and paper towels.
Picture of "growth cycle of plant", flower and seed pod.
Activity: Discuss life cycle of plants and use examples or photos to illustrate stages in a plants life (Joshua)
Go out and find plant and illustrate "grown" plants. Come back inside and look at examples.
"Plant a Joshua seed in a bag" to take home. See below activity for journal use.

Post Field Trip Activity: Keep a journal of your seeds growth. What factors have affected it's growth? What plants were easier to grow? How will this affect the types of plants that grow up in the desert?
Write a story of the life of your seed and how the other animals played a part in the life of your plant.

Conclusion: Organisms that live in the desert have life cycles. Each is different in how they grow up but each has adapted to the climate found in the desert.

BURROW

BARK

HOLE IN TREE

MUD

UNDER ROCK

PLANT LEAVES

UNDER WATER

Cactus Wren

Underground

no habitat

no habitat

no habitat

no habitat

no habitat

no habitat